

CLAIMS

What is claimed is:

1. A 3-D imaging system comprising:
an optical apparatus having an objective lens;
5 an image recording device; and
a relay subsystem coupled between the objective lens and the
image recording device along an optical axis, the relay subsystem having
an aperture element that includes an opening offset from the optical axis
placed at the exit pupil.
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2. The 3-D imaging system of claim 1 further comprising rotation means
for rotating the aperture element about the optical axis.
3. The 3-D imaging system of claim 1 wherein the relay subsystem further
15 includes a first lens group and a second lens group spaced apart with the
aperture element disposed therebetween.
4. The 3-D imaging system of claim 3 wherein the first lens group includes
at least one field lens and the second lens group includes at least one
20 focusing lens.
5. The 3-D imaging system of claim 1 wherein the relay subsystem further
includes a focusing lens spaced apart from the aperture element along the
optical axis.
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6. The 3-D imaging system of claim 1 wherein the optical apparatus
comprises a microscope.

7. The 3-D imaging system of claim 1 wherein the optical apparatus comprises a telescope.
- 5 8. The 3-D imaging system of claim 1 wherein the optical apparatus comprises an endoscope.
9. The 3-D imaging system of claim 1 wherein the optical apparatus comprises a borescope.
- 10 10. The 3-D imaging system of claim 1 wherein the image recording device is a CCD camera.
11. The 3-D imaging system of claim 1 further comprising a image processor for processing images acquired by the image recording device.
- 15 12. A 3-D imaging system comprising:
an illumination subsystem having an aperture element with an opening offset from an optical axis;
an optical apparatus having an illumination path and an imaging path, the optical apparatus coupled to receive illumination from the illumination subsystem along the illumination path; and
20 an image recording device coupled to the optical apparatus along the imaging path.
- 25 13. The 3-D imaging system of claim 12 further comprising rotation means for rotating the aperture element about the optical axis.
14. The 3-D imaging system of claim 12 wherein the illumination subsystem further includes a field diaphragm, an aperture diaphragm and a

condenser spaced apart along the optical axis with the aperture element disposed between the field diaphragm and the aperture diaphragm.

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15. The 3-D imaging system of claim 12 wherein the optical apparatus comprises a microscope.
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16. The 3-D imaging system of claim 12 wherein the image recording device is a CCD camera.
17. The 3-D imaging system of claim 12 further comprising a image processor for processing images acquired by the image recording device.
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18. A module for coupling between an optical apparatus and an image recording device, the module comprising:
a lens group;
an aperture element spaced apart from the lens group along an optical axis, the aperture element including an opening offset from the optical axis.
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19. The module of claim 18 wherein the lens group includes at least one focusing lens.
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20. The module of claim 19 further comprising a field lens disposed along the optical axis with the aperture element disposed between the field lens and the focusing lens.
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21. The module of claim 18 further comprising rotation means for rotating the aperture element about the optical axis.

22. The module of claim 21 further comprising a housing that encloses the lens group, the aperture element and the rotation means.

5 23. The module of claim 22 wherein the lens group includes at least one focusing lens and further comprising a field lens disposed along the optical axis with the aperture element disposed between the field lens and the focusing lens.

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